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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/613,422	07/02/2003	Lucy M. Bull	B500790	5145
23911 7590 01/08/2009 CROWELL & MORING LLP INTELLECTUAL PROPERTY GROUP P.O. BOX 14300 WASHINGTON, DC 20044-4300				
EXAMINER				
SINGH, PREM C				
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1797				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/613,422

Applicant(s)

BULL ET AL.

Examiner

PREM C. SINGH

Art Unit

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2, 5-18, 21, 22, 25-27 and 30-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 5-18, 21, 22, 25-27 and 30-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsman's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Amendment to claims 1 and 25 and cancellation of claims 19, 20, 28 and 29 is noted.

New grounds of rejection necessitated by the claim amendments follow.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1, 2, 5-18, 21, 25-27, 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cain et al (US Patent 2,877,257) in view of Moore, Jr. et al (US 2002/0173556 A1).

4. The Cain reference discloses a process for removing metal contaminants from a Fischer-Tropsch derived hydrocarbon stream. At least a portion of these contaminants would necessarily originate from the processing equipment and catalyst. The process comprises passing the hydrocarbon stream to a treatment zone where the hydrocarbon stream contacts an aqueous acidic stream that is passed to the treatment zone (i.e., extraction column). The acidic stream should have a strength corresponding to concentrations of sulfuric acids ranging from about 1.5 to about 50 weight percent. These concentrations would necessarily be within the claimed ranges. The resulting mixture that includes precipitated solids is then separated to recover an extracted hydrocarbon stream and a modified acidic stream. The acidic stream can comprise an inorganic acid such as sulfuric acid or an organic acid such as acetic acid. The acidic

stream used in the process may also comprise the aqueous phase produced in the F-T process. This produced aqueous phase contains acetic acid. Also, the examples in the Cain reference clearly are batch treatments but it is also clear from Figure 2 that the process can be operated continuously. The extraction step is performed until essentially all the iron is removed from the hydrocarbon stream. This would necessarily disclose the limitations of claim 26 (See column 1, lines 15-36; column 2, lines 48-51; column 3, lines 9-35 and 52-75; column 4, lines 1-43; column 7, lines 41-73; column 8, lines 1-24; the examples, and Figure 2).

The Cain reference also discloses that acetic acid is used in the extraction processes. Therefore, such an extraction would necessarily produce a third phase as claimed.

The Cain reference does not disclose using a cobalt catalyst in the F-T step and does not disclose that aluminum is removed from the hydrocarbon. The Cain reference also does not disclose the extraction conditions of claim 27 and does not disclose passing the acid extracted F-T derived hydrocarbon stream to a hydroprocessing reactor and then hydroprocessing this stream.

The Moore reference discloses that F-T streams are produced in processes that utilize catalysts such as iron or cobalt catalysts (See paragraph [0079]). The Moore reference also discloses that F-T derived streams may be fractionated (i.e., distilled) and hydrotreated (See paragraphs [0047] and [0048]).

Since Moore reference indicates that iron or cobalt catalysts are equally effective, one can be substituted by the other. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Cain by using a cobalt catalyst in the F-T step as suggested by Moore. It is expected that the Cain's process will be equally effective with cobalt catalyst also. See *In re Fout*, 675 F.2d 297, 213 USPQ 532 (CCPA 1982). Regarding the removal of aluminum contamination, such removal would necessarily occur in the modified process since the same feed as claimed is contacted with the same acid as claimed.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Cain by distilling and hydrotreating the purified hydrocarbon stream as suggested by Moore because a stream with fewer undesired components such as olefins will be produced.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Cain by utilizing the conditions of claim 27 because one would utilize any conditions that result in the removal of contaminants disclosed by Cain.

5. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cain et al. (US 2,877,257) in view of Moore, Jr. et al. (US 2002/0173556 A1) as applied to claims 1, 2, and 5-18 above, and further in view of Zhou (US 6,476,086 B1).

The previously discussed references do not disclose adding a surfactant to the hydrocarbon stream.

The Zhou reference discloses a process for separating contaminant particles from an F-T derived stream. The process comprises contacting the stream with a composition that comprises a surfactant. The reference also discloses that filtration techniques have been used to separate solid contaminants from F-T derived streams (See column 1, lines 29-40 and 65-67; column 2, lines 1-67; and column 3, lines 1-11).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the teachings of the previously discussed references by adding a surfactant to the hydrocarbon stream as suggested by Zhou because the addition of a surfactant will enhance the separation process.

6. Claims 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cain et al. (US 2,877,257) in view of Moore, Jr. et al. (US 2002/0173556 A1) and Zhou (US 6,476,086 B1).

With respect to claims 32 and 33, Cain reference discloses production of Fischer-Tropsch derived hydrocarbon stream by passing syngas to a FT reactor (See column 1, lines 30-54). Figure 2 of Cain invention also discloses that the downstream processing of the FT products is a continuous process. This implies that FT synthesis should also be a continuous process.

As discussed earlier, the Cain reference does not disclose that an additive is added to the reactor and does not disclose filtering the hydrocarbon stream after the adding step. The reference also does not disclose adding a surfactant to the hydrocarbon stream or passing the F-T derived hydrocarbon stream to a hydroprocessing reactor.

The Moore reference discloses that F-T streams are produced in processes that utilize catalysts such as iron or cobalt catalysts. See paragraph [0079]. The Moore reference also discloses that F-T derived streams may be fractionated (i.e., distilled) and hydrotreated (See paragraphs [0047] and [0048]). Moore also confirms that the FT synthesis is a continuous process (See paragraph [0076]).

The Zhou reference discloses a process for separating contaminant particles from an F-T derived stream. The process comprises contacting the stream with an additive composition that comprises a surfactant. The reference also discloses that filtration techniques have been used to separate solid contaminants from F-T derived streams (See column 1, lines 29-40 and 65-67; column 2, lines 1-67; and column 3, lines 1-11). Zhou also discloses use of an internal filter for slurry-bed iron catalyst FT reactors (See column 1, lines 29-31, 50-53).

It would have been obvious to one having ordinary skill in the art to modify the process of Cain by adding the acid to the reactor because the same purification would take place with the added benefit of cost savings due to the reduced equipment requirement.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Cain by filtering the product resulting from the extraction step as suggested by Zhou because filtering will remove any solid contaminants from the product.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Cain by adding a surfactant to the hydrocarbon stream as suggested by Zhou because the addition of a surfactant will enhance the separation process.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Cain by hydrotreating the purified hydrocarbon stream as suggested by Moore because a stream with fewer undesired components such as sulfur, nitrogen and olefins, will be produced.

Response to Arguments

7. Applicant's arguments filed 11/14/2008 have been fully considered but they are not persuasive.
8. The Applicant argues,

"In regard to claim 1, Applicants respectfully submit that Cain does not disclose or suggest contacting the Fischer-Tropsch derived hydrocarbon stream with the aqueous acidic stream in the treatment zone to form a *mixed stream containing Al contamination in particulate form*. As discussed above, Cain extracts dissolved or occluded iron contamination from crude hydrocarbon synthesis oil with an aqueous acid solution. The acid extract retains the iron contamination in the form of *dissolved* chemicals including iron salts. Brown precipitate, including the iron contaminant, forms only upon addition of a suitable base to the acid extract. Accordingly, neither the oil leaving the extractor nor the acid extract contains iron contamination in particulate form or any other metal contamination, such as Al contamination, in particulate form. In contrast, in the method of claim 1, contacting the Fischer-Tropsch derived hydrocarbon stream with the aqueous acidic stream in the treatment zone forms a *mixed stream containing Al contamination in particulate form*".

The Applicant's argument is not persuasive because Cain discloses separation of iron and iron compounds from the hydrocarbon stream which may be in the solution or occluded form. (See column 1, lines 15-36; column 2, lines 48-51; column 3, lines 9-35 and 52-75; column 4, lines 1-43; column 7, lines 41-73; column 8, lines 1-24; the examples, and Figure 2). Although Cain does not specifically disclose separation of Al particulates, it is known to those skilled in the art that support materials including alumina are used in the Fisher-Tropsch (FT) catalyst (See Moore, paragraph 0079). Thus, Al will necessarily be present in the FT synthesis product. Thus, in Cain process while iron is separated, Al will necessarily be separated simultaneously.

9. The Applicant argues,

"In regard to claim 25, Applicants respectfully submit that Cain does not disclose or suggest extracting A1 contamination from the Fischer-Tropsch derived hydrocarbon stream by contacting the

Fischer-Tropsch derived hydrocarbon stream with the aqueous acidic stream in the treatment zone at extraction conditions to form a mixed stream, containing Al contamination in particulate form, comprising at least one acidic extracted Fischer-Tropsch derived hydrocarbon stream, a modified aqueous acidic stream, and a third phase. As discussed above, Cain extracts dissolved or occluded iron contamination from crude hydrocarbon synthesis oil with an aqueous acid solution. The acid extract retains the iron contamination in the form of dissolved chemicals including iron salts. Brown precipitate, including the iron contaminant, forms only upon addition of a suitable base to the acid extract. Accordingly, neither the oil leaving the extractor nor the acid extract contains iron contamination in particulate form or any other metal contamination, such as Al contamination, in particulate form. In contrast, in the method of claim 25, extracting Al contamination from the Fischer-Tropsch derived hydrocarbon stream by contacting the Fischer-Tropsch derived hydrocarbon stream with the aqueous acidic stream in the treatment zone at extraction conditions forms a mixed stream, containing Al contamination in particulate form".

The Applicant's argument is not persuasive because the limitations of claim 25 have been discussed in the Office action above (See column 1, lines 15-36; column 2, lines 48-51; column 3, lines 9-35 and 52-75; column 4, lines 1-43; column 7, lines 41-73; column 8, lines 1-24; the examples, and Figure 2). The Cain reference also discloses that acetic acid is used in the extraction processes. Therefore, such an extraction would necessarily produce a third phase as claimed. As discussed earlier, although Cain does not specifically disclose separation of Al particulates, it is known to those skilled in the art that support materials including alumina are used in the Fischer-Tropsch (FT) catalyst (See Moore, paragraph 0079). Thus, Al will necessarily be present in the FT synthesis product. Thus, in Cain process while iron is separated in solution form, Al particulates should necessarily be separated simultaneously.

10. The Applicant argues,

"Cain's acid extract contains dissolved chemicals, including water soluble chemicals, iron salts, and salts of basic nitrogen compounds, which are subsequently recovered by distillation. In contrast, the presently claimed filtering step facilitates removal of Al contamination in particulate form from the at least one acidic extracted Fischer-Tropsch derived hydrocarbon stream. As discussed in the specification, the presently claimed acid extraction processes are desirable as they apparently convert soluble metal contaminants into particulate form and may agglomerate very small particulate contaminants into larger particles, which may then be removed by filtering. Page 19, line 30-page 20, line 1. Moore is merely cited for the propositions that Fischer-Tropsch streams are produced in processes that utilize catalysts such as iron or cobalt catalysts and that Fischer-Tropsch derived streams may be fractionated (i.e. distilled) and hydrotreated. Office Action at page 4. Accordingly, as cited, Moore does not correct the above-noted deficiencies of Cain. Therefore, for at least the above reasons, withdrawal of the § 103(a) rejection over Cain in view of Moore is respectfully requested".

The Applicant's argument is not persuasive because as discussed earlier, FT synthetic hydrocarbon in Cain's process will inherently have catalyst fines comprising Al particulates due to the fact that alumina is used as a support in the FT catalyst (Moore, paragraph 0079). Cain discloses, "In carrying out the process of our invention crude hydrocarbon synthesis oil, for example, is first washed with an aqueous acid solution. This washing step, depending on the strength of the acid solution, is repeated until no brown precipitate is produced on the addition of a suitable base, such as ammonium hydroxide, to the acid extract. When extraction has proceeded to this stage, the absence of such a precipitate on neutralization indicates removal of the metal contaminant" (Column 3, lines 19-25). Obviously, Cain should necessarily be using a

separation device, including a filter, to separate the precipitate. Thus, Cain in view of Moore renders the claims 1 and 25 *prima facie* obvious.

11. The Applicant argues,

"Examiner cited Zhou against cancelled claims 19-20 and 28-29 in particular for the proposition that Zhou discloses that filtration techniques have been used to separate solid contaminants from Fischer-Tropsch derived streams. Office Action at page 6. Applicants respectfully assert that the independent claims, as amended, are patentable over Cain in view of Moore and further in view of Zhou". "For at least the reasons as explained above, Applicants respectfully submit that Cain in view of Moore does not disclose or suggest the presently claimed methods. As cited, Zhou does not correct the many above-noted deficiencies of Cain in view of Moore".

The Applicant's argument is not persuasive because because Zhou reference discloses a process for separating contaminant particles from an F-T derived stream. The process comprises contacting the stream with a composition that comprises a surfactant. The reference also discloses that filtration techniques have been used to separate solid contaminants from F-T derived streams (See column 1, lines 29-40 and 65-67; column 2, lines 1-67; and column 3, lines 1-11).

Thus, the independent claims as well as their dependent claims are *prima facie* obvious over Cain in view of Moore and Zhou.

12. The Applicant argues,

"Thus, in the process of Cain, there is no place where filtration of catalyst fines is necessary. More particularly, in the process of Cain, neither the washed oil leaving the extractor nor the neutralized oil contain particulates that must be filtered out. Thus, one of ordinary skill in the art would not have been motivated to use Zhou's disclosure of filtration in combination with Cain's acid extraction to arrive at the presently claimed methods of claims 1 and 25".

The Applicant's argument is not persuasive because as discussed earlier, Cain process uses a FT catalyst to produce FT hydrocarbon products contaminated with occluded iron (See Cain: column 1, lines 51-54). It is known to those skilled in the art that a FT slurry process will produce hydrocarbon products contaminated with catalyst fines (See Zhou: column 1, lines 17-28). These catalyst fines will necessarily have Al particulates because FT catalyst has alumina as support as disclosed by Moore (See Moore: paragraph 0079). These catalyst fines will necessarily require a filtration process as disclosed by Zhou (See Zhou: column 1, lines 29-33). Thus, the combined teachings of Cain, Moore and Zhou render the claimed invention obvious.

13. The Applicant argues,

"Applicants respectfully submit that modifying the process of Cain by adding acid to the reactor that produces the primary oil would not disclose or suggest to one of ordinary skill in the art the steps of providing an additive to the contents of the Fischer-Tropsch reactor to precipitate soluble contamination within the reactor and filtering the precipitated contamination from the Fischer-Tropsch derived hydrocarbon stream to produce a filtered hydrocarbon stream, as required by independent claim 32. If, as the Examiner alleges, adding acid to the reactor producing the primary oil of Cain results in the *same purification, dissolved chemicals* including water soluble chemicals, iron salts, and salts of basic nitrogen

compounds would be present in acid extract in the reactor. Accordingly, the *same purification would not provide particulate contaminants* in the oil produced in the reactor. As such, there would be no need to filter particulate contaminants from the produced oil. Therefore, for at least the above reasons, withdrawal of the § 103(a) rejection of claims 32 and 33 over Cain in view of Moore and further in view of Zhou is respectfully requested".

The Applicant's argument is not persuasive because as discussed earlier, Cain produces FT hydrocarbon products contaminated with occluded iron (See Cain: column 1, lines 51-54). Although Cain does not specifically disclose particulate Al in the FT products, it is known to those skilled in the art that a FT slurry process will produce hydrocarbon products contaminated with catalyst fines (See Zhou: column 1, lines 17-28). These catalyst fines will necessarily have Al particulates because FT catalyst has alumina as support (See Moore: paragraph 0079). These catalyst fines will necessarily require a separation process which could be a filtration process as disclosed by Zhou (See Zhou: column 1, lines 29-33).

14. In conclusion, the claimed invention is *prima facie* obvious over combined teachings of Cain, Moore and Zhou.

Conclusion

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PREM C. SINGH whose telephone number is (571)272-6381. The examiner can normally be reached on 7:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

PS 010409

/Glenn A Caldarola/
Acting SPE of Art Unit 1797